HALF A DAY AHEAD.

APR. 24TH, 2022 10:19 PM

Календар - це важливо. Щоб знати, коли що святкувати.
На Ивана (на Шутку, вона ж - ива, верба) - завжди сиро і мокро у нас. На Великдень - сонце і тепло.
Так завжди, я підкреслюю. Але є зсув. Кожен рік - свій.
Бо роки ходять парами. І т.д. Вам цього знати не треба, всього.
У майя, наприклад, цикл був у 292 дні х 2. П'ять таких циклів - рівно чотири роки по 365 днів.
Семиденний тиждень - теж родом звідси ж.
Велика тема. Цікава.
Але халяви мавпам тут зась. Хай дохнуть, спочатку. Набридли.
Не люди, тому, що. Срань, брехлива, нагла й тупа.
п.с. злива бахнула ось, конкретна.
Не вгадати, тепер - бомблять, чи гримить. О, часи!
п.п.с. Протигази беріть, пригодяться.

LINK 2 COMMENTS REPLY

Двигун прогресу.

APR. 24TH, 2022 03:40 PM

Як перетворити проблему - в ресурс, необхідний майбутньому?
Просто. Дивитися на сабж - і думати.

Є два варіанти досягнення мети: 1) якшо мета відома - підбираєте шляхи та засоби, які до неї ведуть.
2) якщо не відома - тримаєтесь вірного шляху та засобів - вони виведуть.
)3 комбінація перших двох у різних пропорціях. В т.ч. й від зворотнього (в архів!).

Проблема яка у вас?
П=Б-М.
З бажаннями, чи із можливостями?

LINK REPLY

Мозок використовує шаблони, а не рахує.

APR. 24TH, 2022 11:37 AM

Прекладається, під натхнення. Задля порівняння передової буржуйської думки - з нашою.

Зауважимо, що думки ідуть паралельними шляхами. Оскільки наша їхніми дослідженнями (досі) не користувалася, назагал.
Ну і, до математичного опису структури шаблону тензорами їм, іще, як до неба - рачки. Стандартно відстають на два роки, тобто. Чому так - здогадайтеся самі.

John Ball Follow
Apr 15 · 15 min read ★ · Listen

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Brains use Patterns, not Processing

Is there a model of the brain that does **not** use pure *computation*?

Why? Because the computer paradigm, especially when applied to natural language understanding (NLU) and brains, isn't effective when needed in artificial intelligence (AI) applications.

Patom theory (PT), a **pattern-matching** paradigm, is a different approach based on the analysis of brain damage, scans and capability. PT was designed to explain normal brain function and the effects of brain damage. A brain theory should also have evolutionary plausibility since a human brain is very similar to many other animal's brains.

Instead of ***data*** driving a brain with some kind of **construction** or **process**, it is stored patterns driving everything: sensory patterns stored with their originating sensors, and matched patterns continuing away from the senses into the brain for further consolidation, specialisation and pattern composition.

In short, the brain is a distributed and connected model starting with senses and ending with muscles, and the reverse. And its role is to store, match and use the resulting hierarchical, bidirectional patterns. Deficits from brain damage are the consequence of lost patterns or their connections to other patterns.

Perhaps the most important take-away today is how a brain **represents** multisensory information. It isn't *encoded data*, but *associated meanings* tied back to *sensory experience*. It's a powerful model that, even if incompletely linked to senses, can drive useful systems like NLU.

We will try to answer what would happen if you factor out everything except for language (auditory/spoken words or visual/written words). Could you still *understand*?

The Problem of Data and Computation

A *computer* represents information as **data**. Data can be just about anything. It can be audio in the case of digitized sound. It can be video in the case of compressed video and audio. It can be text in the case of simple text files, or formatted text in the case of, say, a word processing document. To use data, you simply *extract* it, *transfer* it, and *process* it into a form like its original. Some call this construction or reconstruction. When you play a movie on your PC, the PC is **constructing** a multi-media environment.

So how does the brain do that work? Where does it *process* images into *data*? How does it replay movies in our mind?

As computer scientists, we are taught the basics of ***processing***. Then, for artificial intelligence, we wonder how the brain is *encoding* information, passing it around, and being remarkably fault-tolerant! I mean, losing a single wire in a computer can totally break it, while many people have suffered large losses of brain matter with little consequence.

The concept of **data** has been haunting us in the AI community since AI was created because it is such a strong paradigm. **Computing** with data is very powerful, but it isn't brain-like. Framing something that is not understood, like: "the eye *encodes* the information in a very complex way" or "we don't understand how the brain *encodes* and *shunts* visual data yet" appears to be highly misleading.

David Hume's Alternative to Data

To explain an alternative model, I'm going to use **David Hume**'s work, since his explanations from 1739, a time roughly 200 years before **Alan Turing** founded modern computing, are still helpful.

His model can be thought of in three parts:

1. The sensory input (**impressions**) and memory (**ideas**) model for a single sense.
2. The multiple sense model of objects (**simple** and **complex**).
3. The memory associations possible (**resemblance**, **contiguity**, and **cause or effect**).

1. David Hume's Memory Model

First, Hume defines our perceptions of the world, detected by our sensors:

> *"These perceptions that enter with the most force … we may name **impressions**; and, under this name, I comprehend all our sensations, passions and emotions …"*

Today, we would probably call impressions *sensory input*. Animal sensors include integrated neurons, detecting the properties that connect that sense to the rest of the brain (I'm calling all neurons a part of the brain). ***Impressions*** are therefore detected in a sense organ (eye, ear, skin, nose, tongue, semicircular canal, …).

The impression doesn't just hit the edge of the brain and do nothing. Connections from sense organs have multiple regions of specialization, different in each individual, but ultimately the pathways in the brain are made use of — connections from inherited brain anatomy. The use of brain matter in a region increases with learning with adjacent areas taking up more space for the region.

Then he continues with memory:

> *"By ideas, I mean the faint images of these in thinking and reasoning …"*

Today, we think of memory as the stored representation of something. Here, Hume makes an observation about the difference between input, and recalled memory. Input is more vivid, while its recall is faint. As there is no theatre in the brain, perhaps the memory is replayed the same way as from an impression? That would account for the lower intensity, but where is the idea?

Patom theory posits the same brain area that receives the impression stores it, and so the idea simply activates the same outputs at the same place.

The consequences of an **impression** or an **idea** being activated would be identical, since the same thing is activated.

Intensity could be a reflection that the primary sensory brain areas that store the relevant ideas are not directly in our sense of awareness, an older brain stem area that can get direct access to impressions separately. Without impression input, the only input to awareness is the brain's bidirectional loops.

Hume now moves into a topic that requires us to contemplate more than just the sense-by-sense input, but how a brain handles multi-sensory input.

Object Recognition

Sensory input is directed to localized brain regions. We didn't know this in the 1730s, of course. But to recognize an object like an apple, for example, there are a few different sensory areas to consider. The tactile area to hold and feel the apple, the gustatory area to taste it, the olfactory to smell it and the shape and color of it in the visual area. These are all different places in the brain, but the brain appears to integrate it.

In theory, there should be a brain location that connects these sensory patterns together at the multi-sensory level. That would allow any of the elements of the object to recognize the entire object. There is such a place that I discovered during research some years later:

> *"The entorhinal cortex is part of (an) … interconnected set of cortical areas that … is closely associated with the hippocampal formation on the one hand and with a variety of multimodal association areas of the cortex such as parietal, temporal, and prefrontal cortex … The entorhinal cortex is thus uniquely positioned as an interface between the neocortex and the hippocampal formation …"*

What is the hippocampus? A brain region involved in the storage of long-term episodic memories[i]. An episodic memory will include the location, objects/people present, how you felt, what happened there. It aligns with Patom theory:

> *"The human neocortex, for example, looks very similar between different regions as if it could be swapped. This makes sense with PT, as each region does the same thing — storing, matching and using patterns. The method allows the growth of a region in size, extending it to store new patterns in the nearby space."*

The entorhinal cortex connects a large part of the brain (let's presume it is connecting the patterns recognized in sensory areas together) with the area of the brain that helps to store episodic memory.

In NLU, we want to connect objects and their actions and states into context. The current context first (the Immediate Common Ground) and then when a new event starts, the ICG can be added to long-term memory, the General Common Ground.

The proximity between multisensory memory, and context is useful. Separately, multisensory memory needs to represent what is can do, have and be. That appears to take place with more forward projections into the frontal lobes; it is associated as therefore accessible.

2. Back to Hume — Objects

Using Hume's model, sensory input such as from eyes and ears are impressions. They join in a brain into multisensory patterns. The recognition of a multisensory pattern — an object — is therefore separated from the sensory input, but integrated through the region for multisensory patterns. An **impression** therefore includes at least the **sensory** impressions and their common, **connected** multi-sensory patterns.

These patterns are stored as *ideas*, in the same brain regions that receive them. Through ongoing experience, contiguity helps resolve ambiguous input by tying back multiple, different patterns to a single set of representations.

Note: Hume's science didn't have today's wealth of information about brains or computers, but there is a difference between multi-sensory objects and single sensory experience.

Now, he divides perceptions (**impressions** and **ideas**) into two categories — simple and complex:

> *"**Simple** perceptions, or impressions and ideas, are such as admit of no distinction nor separation"*

That is, simple perceptions are the same, whether an **experience** (impression) or a **memory** (idea). When an object is recognized, it includes some or all of the related senses, each of which contributes to the pattern.

You can imagine contiguity and resemblance allows simple impressions to be identified and tracked by the brain, but not complex impressions. You can track the changes of an objects shape and shade over time, but that's harder to do with the leaves on a tree as the wind blows.

Complex impressions involving many different objects may usually be the same, such as a room's layout, but changes in individual elements may go unnoticed, with the existing complex idea selected by default, if the brain doesn't detect the difference.

But regarding complex perceptions:

> *"The **complex** … may be distinguished into parts. Though a particular colour, taste, and smell, are qualities all united together in this apple, it is easy to perceive they are not the same…"*

When you walk into a room, you may recall eight of the twenty people there, and the color of the back wall, but perhaps not the other people, the table's design or the other walls. **Complex** experiences may not be perfectly stored in memory (as ideas), and vice versa.

This leads to:

> *"… many of our **complex** ideas never had impressions that corresponded to them, and that many of our complex **impressions** never are exactly copied in **ideas**"*

His conclusion is that **simple** ideas come from **simple** impressions and they are identical. **Complex** ideas and impressions **resemble** each other, but are not always exact copies of each other. From a pattern-matching perspective, this is reasonable, since it is not a trivial task to recognize large numbers of objects, many of which are unimportant, in order to identify the current context.

Patom theory memory comparison

In Patom theory, all a brain can do is store, match and use patterns. And each pattern must be unique — atomic — in that it cannot be used to represent two different things, nor can it be **duplicated** to represent the same thing. Pattern-atoms are unique to remove *processing* from the model. The **pattern** is the *same* only if it is the *same* Patom. That eliminates search from the system.

So, brain material that receives input can store that as a pattern. When it is received again in the future, it can **match** it and then, **use** it by telling all connected that it was matched.

> Note that a pattern can be a snapshot, a set of elements active at one time, or a sequence, a group of patterns in a sequence. Sequences are needed for many things, such as the order used in spelling, the sequence of words in a sentence and the passage of time in an event.

Now apply this model to the senses, of which humans have quite a few. We often hear about the five senses, but in reality, a brain has many more to consider such as the vestibular system that provides balance and body position supported by the semi-circular canals and proprioception. Any of the human senses are an integrated part of the brain.

And Patom theory starts matching patterns in the senses, themselves.

Next the brain region topology comes into play. The typical brain region has forward and backward projections to enable ***hierarchical*** operation. Forward projections allow patterns that are composed of this to be matched — as pattern ***use***. But the backwards projections are equally important. When a subsequent pattern is matched, how can that be reflected from the source? The source needs to update the new pattern next time it is matched and the reverse link makes this possible.

There is one more important use of reverse links — **recall**.

For Hume to imagine an apple, his brain must connect the word in English, to its multi-sensory meaning (an object-level Patom). That object level Patom is only an index to its representation, so using its reverse links to sensory patterns, the smell, taste, feel and look of the apple are activated and their pattern use activates awareness of the apple, albeit as an idea, not an impression.

The brain is a recognition engine primarily. It reacts to input. But it also recalls experience using hierarchical interactions.

All our references are represented like this. For example, the word ‘cat’ is a sound, that connects to a set of multisensory objects, that in turn, connect to a set of sensory objects.

Evolution: reverse links (access full pattern)

The processing model is the opposite to pattern matching. Pattern matching *recognizes*. Processing *constructs*. The idea that the brain ‘pattern-matches’ seems easy to support in evolutionary terms, since the variety of senses all need to match patterns — so a single model applies. The combination of patterns is also consistent across species, with multiple senses in a brain integrated similarly, even with less-common sense variations like a bat’s echolocation/sonar or a shark’s lateral line.

The need for a process-and-data model to be constructed is much harder to support in a brain, since mutations would need to travel in pairs. At the same time a new sensory capability emerges from a mutation, an equivalent processing capability needs to evolve in a brain and get connected. By contrast, pattern matching is already tested and operating at multiple levels for other senses, so nothing needs to change beyond having space for the expanding region.

The key use of pattern-atoms relates to **memory**. The memory from one modality can be traced back to originating senses through the reverse links in the hierarchy. In the example above, a specific 'cat' in language connects to a multi-sensory pattern. That's Hume's *idea*. If it didn't, you wouldn't recognize the cat either by some sense or by language. The pattern-atom for the multisensory cat connects to pattern-atoms for single senses. One of those, a visual pattern, can be the visual *idea* of cat in David Hume's model.

Loss of Color Memory only!

Something Patom theory explains is brain damage, such as the (rare) loss of color recognition. Jonathan I was a patient who lost the ability to perceive color[ii] (the deficit is named cerebral achromatopsia) with brain damage to an area called V4 (on both the left and right side of the brain). The impact was described as the loss of color perception, leaving only "dirty shades of grey."

*"Even his power to **imagine** colors, which before had been vivid, was gone. It never returned."*

Why would ***imagining*** color be lost? Because either the material that associates color for visual memory was lost or its reverse connections were broken.

Human Language (NLU)

For human language to work with Patom theory, pattern matching takes place in senses, connects to multisensory patterns and then gets connected in context. That's the natural function of an animal's brain. Language emerges simply by connecting language-specific patterns for words and phrases and connect it to the context elements.

That's the approach taken at PAT and it is effective. It allows a detailed model of the world to be represented with high accuracy, without needing the reverse links to sensory patterns (yet).

3. Hume's Associations

Now that we have a representation for objects, those memories (**ideas**) can be combined.

The memory associations (**resemblance**, **contiguity**, and **cause or effect**) are Hume's principles of idea connections. In terms of this model's completeness, Hume wrote[iii]:

"... that this enumeration is complete ... may be difficult to prove to the satisfaction of the reader ... or even to a man's own satisfaction"

Resemblance

How can resemblance be detected by a brain? Does a tennis ball resemble an apple? Visually, both are somewhat round or circular. Their colors are normally different, but apples come in greens, yellows and reds and tennis balls come in a range of colors also. The principle of a pattern-atom is that any *common* pattern is detected, centralized and associated with the entire pattern, effectively creating a set of matches for any given input.

Resemblance is therefore just the matching of one or more patterns from a given comparison item. It isn't a **search**, just **re-use** of the same pattern. For example, a brain

would detect a rhyme because **the same pattern** is detected more than once.

Contrasting this with processing, it can be complex to process (running an algorithm to compare two items) to compare the vast variations in sensory inputs received. Why are two sound waves, two images, or the feel of two surfaces similar? Pattern matching explains it as the detection of consolidated patterns in the sense's **idea**.

Contiguity

Contiguity in time and space is a useful concept. The brain's visual system has a region that detects visual motion[iv], suggesting that the tracking of some pattern over a time sequence is performed by a localized brain area (V5, an area of cortex about one cm in diameter).

How could object motion be localized in a single area? That area would need to find sequential **visual** patterns, one of the two types of patterns in Patom theory (the other is a snapshot pattern, a set of active inputs at some time).

Notice that the visual pattern is a subset of the full visual image, because the brain recognizes objects in the visual field. Motion recognition allows single objects to be detected independently to the background.

Cause and Effect

Hume's analysis of cause and effect is powerful in that causality can only come through experience, not by reason. He said:

"… causes and effects are discoverable, not by reason but by experience,"

Usefully, language is saturated in causality, of course, and our ability to experience the cause of an action makes such associations simple to associate.

For example, a cat moves its paw, and then a balloon pops. "The cat pops that balloon" is understood to mean that the cat caused "that balloon to pop". In a brain, it is easy to see how such an association can be created — there is an instantaneous change in state of the balloon at the same time the cat's paw touches it. Both objects can be seen visually moving, and then a change in state of the balloon. The recognition of the event comes from *meaning*, the recognition of the *referents* and their predicate's *actions* and *states*.

> David Hume was effectively saying, in 1739, that deep-learning won't work for NLU, since you can't find causality in text alone.

The text challenge in discovering causality is easy to see, because text has no associated meaning, unless you already speak the language. Why does "The cat ***ate*** the rat" tell us that a cat did the eating, and a rat was consumed, while "The cat ***popped*** the balloon" tells us that the cat did something that ***caused*** the balloon to pop.

Why does "The cat **ate** the rat" ***not*** mean "The cat caused the rat to eat," like it does with 'pop'. Because we can see what happens. We *understand*.

Equally why does "His wife burped the baby" mean "His wife caused the baby to burp?" and **not** "His wife burped and the baby smiled?" Because we can see what happens, even though burp is a one-role activity.

In linguistics, 'ate' is a 2-role *activity* predicate, while 'pop' is a one-role *achievement state* predicate. Can understanding be done without the *meaning* of the words? Current lack of **understanding** in expensive, well developed deep-learning systems suggests otherwise.

Discussion

Using the Hume model, sensory input such as from the eyes and ears are **impressions**. These are stored as **ideas**, in the same brain regions that receive them. Through ongoing experience, **contiguity** helps eliminate ambiguity, by connecting ambiguous input together, tying multiple patterns to a single set of representations. **Resemblance** allows future patterns to be matched with a level of fault tolerance and, of course, generalization.

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*To access an object's idea (**recall**), its reverse links activate the sensory ideas. Ideas are not directly supported by senses and so are weaker to our awareness. Simple ideas, they are identical to impressions, while with complex ideas, they can have inaccuracies. It's open season regarding making up a complex idea!*

Patom theory proposes that the brain stores, matches and uses patterns. As a consequence, the region that connects to senses is storing a representation of the input, in sufficient detail to match it again. That makes the brain a recognition machine, first, not a recall machine.

Once patterns are matched at the edge layer (the edge of the brain that connects to the world through a single sense) patterns that are matched notify downstream patterns in a hierarchy determined by connectivity. At some point, the senses converge to enable multisensory object recognition.

Unlike the **processing** model that constructs representations with data, a model **based on patterns** and operating in a hierarchy enables the observations of brain damage deficits to be understood.

[i] John Ball, *How Brains Work: Patom Theory's Support from RRG Linguistics*, April 2020, p.45. section 4.7, https://researchers.one/articles/20.04.00003.

[ii] Donald D. Hoffman, *visual intelligence: how we create what we see*, W.W. Norton & Company, New York, 1998, p.108. Note: this book explains the **antithesis** of Patom theory. Hoffman explains the brain as a construction engine, dedicated to specific functions — but how those could evolve or be learned is unanswered.

[iii] David Hume, *Enquiry Concerning Human Understanding*, Sect. III. Of the Association of Ideas, 19, p.18.

[iv] Hoffman, *op. cit.*, p.139–141.

LINK REPLY

(NO SUBJECT)

APR. 24TH, 2022 09:29 AM

Хроники Грядущего

Об "интеллектуалах":

Как показала Украинская Отечественная Война, "интеллектуалы" - это особый отряд сексотов, окормляемых конторой. Их роль - в определенный момент начать (продолжить) дуть в дудку, выданную им тов. майором (или

херр лейтенантом)

Вообще-то интеллект ценится в экстремальной среде - например в местах заключения, в ситуации выживания, противостояния, конкуренции и войны.

Однако,

во первых, интеллектуал, (т.е. настоящий интеллектуал, дез кавычек) должен быть способен верно оценить ситуацию, а затем прояснить и упростить ее. и все это с конкретной целью: для того, чтобы руководствуясь его оценками социальная группа одержала верх.

и во вторых, интеллектуал должен быть настолько независим в своих оценках от указивок и идеологии,. насколько это вообще возможно.

Он должен отстоять свое имя и право на независимость в конкурентной борьбе и на деле.

Ничего этого в Германии, в Мордоре (или в Европе вообще) сегодня просто нет.
Нет конкуренции, нет независимости. Всех “интеллектуалов” кормит смстема, потому что без подкормки эти никчемные существа не выживут и месяца.
Она же, то есть Система, гнобит и отрицает всякую конкуренцию, которая могла бы разоблачить этих свиней у корыта, стерев с них макияж.

И потому, в итоге, мы имеем тупых и ленивых блядей обоего пола, единственное достоинство которых - солидный прикид и соответствующая внешность.

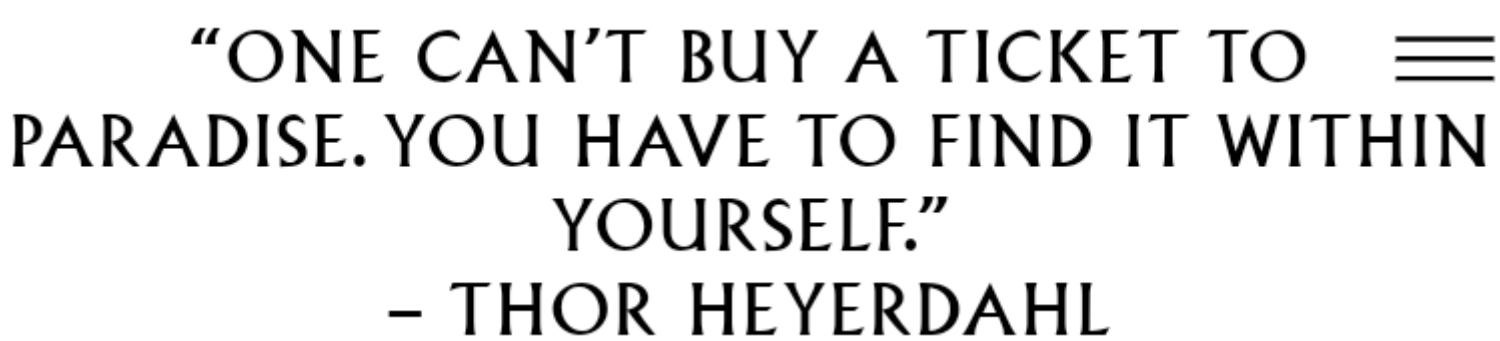
По этой же причине такие люди как я, в среде этих “системных интеллектуалов” по праву считаются не просто токсичными, но и вообще радиоактивными.
По этой же причине всякий доступ к СМИ и кислород для нас Система перекрывает наглухо.

Плохо ли это? Нет, это скорее хорошо, чем плохо.)) Так Система сдохнет побыстрее.

LINK 7 COMMENTS REPLY

(NO SUBJECT)

APR. 11TH, 2022 10:15 PM



LINK REPLY

Багато говорити - мало слухати.

APR. 10TH, 2022 12:33 PM

Робота шаблону подібна на камінь (у чутливіших - камінець), що котиться з гори: поки він ще в непевному стані, наверху, його легко і замінити, і зупинити, і направити, куди треба.
Але як вже покотиться - то покотиться! Далі нанизує всі факти односторонні на себе, як снігова куля - і поки не роздовбнться об стіну реальності - не зупинити його.

Ось так воно просто.

Тому шаблон вбиває завжди. Усіх, хто не здатен ним керувати.
Хто не хапає першу-ліпшу картину реальності, а думає.
Потім ще думає. І ще.. Все життя, якщо треба.

Ваші шаблони змінити вже неможливо! Адже ж ви вже "поняли все". Ваша картина світу стійка і надійна. Ваші шори - міцні. Ідеальний захист рабів. Рабів. Шаблону рабів.
Не поміг ні ковід, ні війна. І січкарня, вочевидь, також не поможе.